

Exam. Code : 105702

Subject Code : 1530

B.Sc. Information Technology Semester—II
NUMERICAL METHODS & STATISTICAL
TECHNIQUES

Paper—V

Time Allowed—3 Hours]

[Maximum Marks—75

Note : Attempt any **five** questions. All questions carry equal marks.

1. Determine the two smallest roots of the equation :

$$f(x) = x \sin x + \cos x = 0, \text{ to 3 significant digits using :}$$

(i) False position method

(ii) Bi-section method.

2. Write the procedure for Simpson's 3/8 rule. Integrate the function $5x^3 - 3x^2 + 2x + 1$ from $x = -1$ to $x = 1$ using Simpson's rule with $h = 1$.

3. Discuss and differentiate between Gauss elimination and Gauss Jordan methods for simultaneous equations with suitable example.

4. The table below gives square roots for integers :

X	1	2	3	4	5
f(x)	1	1.4142	1.7321	2	2.2361

Using second order Lagrange interpolation polynomial; find the square root of 2.5.

5. Use the method of least squares to fit the curve $f(x) = c_0x + c_1x$ for the following data :

X	1	4	16	25
f(x)	16	14	12	10

6. (a) A student while calculating the mean and standard deviation of 25 observations obtained a mean of 56 cm and a standard deviation of 2 cm. It was later discovered that he had wrongly copied down an observation as 64. What is the mean and standard deviation if the correct value is 46 ?

(b) What is the relationship between mean, median and mode ? Justify with an example.

7. Differentiate between mean deviation and standard deviation. Which is a better measure of dispersion and why ? Find the standard deviation from the following table :

Age under	10	20	30	40	50	60	70	80
No. of persons dying	15	30	53	75	100	110	115	125

8. Write short notes on the following :

- (a) Types of errors
- (b) Problem of multiple roots
- (c) Divided differences.